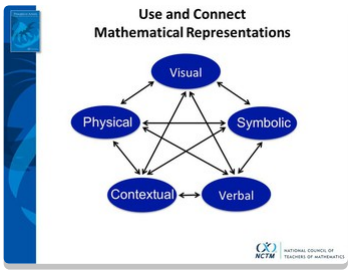
#INspirEDmath

November 2018, Volume 5

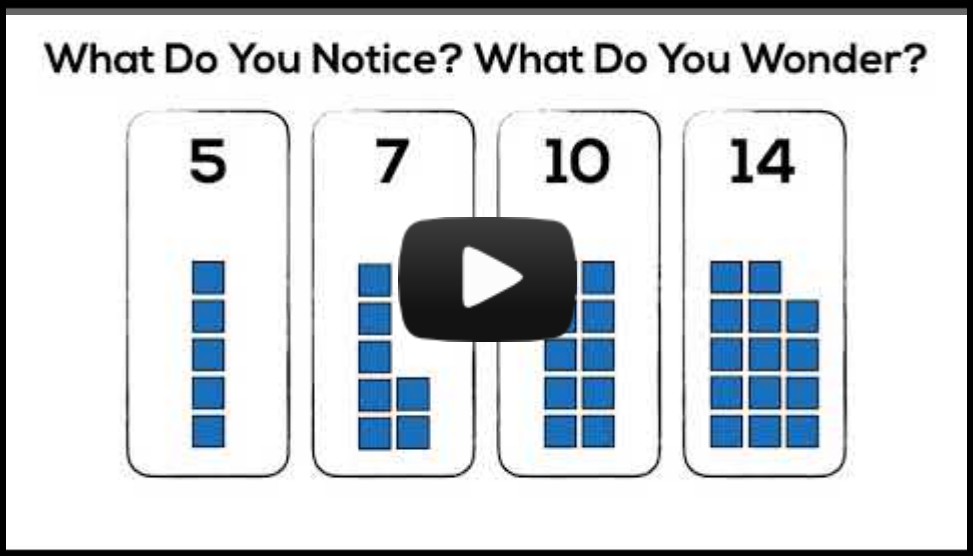
Giving Thanks for Diverse Learners!



This month we focus on *NCTM's Principles to Action's* third practice, using and connecting mathematical representations. "Do you remember the voice of Charlie Brown's teacher? We aren't sure what she's saying but the sounds of "wah, wah, wah" wash over us as she's talking. For some students, the abstract notation of mathematics, whether 1/2 + 1/3 = 5/6 or f(x) = x^2 + 3x + 1 or Area = length × width, is a visual version of this effect" (S. Moore). By allowing students to create, use, and connect multiple representations on their terms we help provide students access to mathematics in a way that makes sense to them. We should be thankful for students with diverse perspectives and approaches. They make math fun!

Represent Math Visually with MathisVisual.com

https://www.youtube.com/watch?time_continue=94&v=0n7U2U2Ko2c



Problem of the Month!

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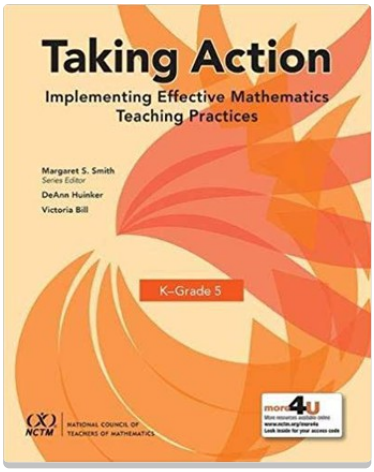
This one is a beauty for many reasons! First... it's really fun! I ***mean*** seriously... (did you see what I did there?). Second, there is not simply one correct answer! There can be many solutions! I can't think of a better way to make learning about mean, median, mode, and range fun!

Your goal, find numbers to fit in each of the cells that makes each row and each column true. Challenge yourself! Challenge your students!

			Mean of 24
			Range of 5
			Mode of 8
Range of 4	**Median of 8**	**Mean of 10**	

November's Focus: Practice #3

1. Establishing mathematics goals to focus learning
2. Implement tasks that promote reasoning and problem solving
3. **Use and connect mathematical representations**
4. Facilitate meaningful discourse
5. Pose purposeful questions
6. Build procedural fluency from conceptual understanding
7. Support productive struggle in learning mathematics
8. Elicit and use evidence of student thinking



Connecting Mathematical Representations

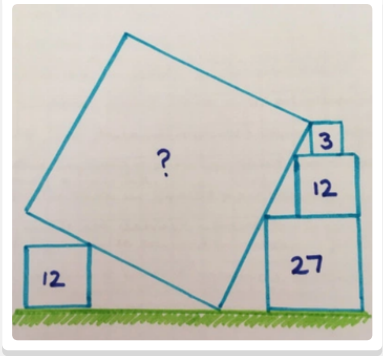
Why should we be on the constant lookout to represent math in a variety of ways? First, multiple representations allow learners whose strengths lie in a variety of areas the opportunity to access math. Not everyone conceptualizes in the same way, using the same methods. Next, by seeking out real-world representations, students begin to see how math can be applied in their daily lives. *Taking Action: Implementing Effective Mathematics Teaching Practices (NCTM, 2017) states,* "Representations play an important role in deepening student learning of mathematics, as well as providing students with multiple entry points and access to the study of mathematics" (p.119). This means that by providing students access to multiple representations throughout their learning of mathematics, we are helping them to connect with their work on a much deeper level.

For more information and inspiration, pick up the *Taking Action* that best meets your needs. NCTM has published three books: grades K-5, 6-8, and 9-12. Each one offers a set of learning experiences designed to foster teacher's understanding of the effective math teaching practices and their ability to apply those practices in their own classrooms.

GNAW on the math!

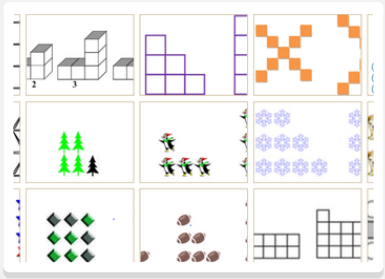
We encourage you to challenge your students to do a little GNAWing, among other things. And no, we don't mean chewing on the leftover bones from the turkey on Thanksgiving! GNAW is an acronym to help your students to represent math Graphically, Numerically, Algebraically, and with Words! See if you can set a goal to start one lesson this week by having your class GNAW on a math problem for their bell ringer activity. It can be quick, simple, but also a very powerful way to help students see math in a variety of ways!

Resources We Love!



Math with Bad Drawings

If you're anything like me, you enjoy a good puzzle... or 20! Math with Bad Drawings is a great math blog, and a great book as well, but this link connects you to 20 fun, challenging geometry questions that will get your brain popping!



Visual Patterns

Help younger students notice and wonder, move into writing rules and expanding on patterns in elementary school, and introduce linear functions in middle school. The possibilities are endless and so much fun! Have students build their own pattern while you are at it! Visit this site for almost 300 ready to use patterns!

Graphing Stories - 15 Seconds at a time.

If you are a middle school or high school math teacher this one's for you! If you teach students in any way how to graph a written story or write a story for a graph you know how difficult that can be for some. Speak to them differently. Try it for yourself here! Your students will be *begging* for more, I promise!

Article: Why Kids Should Use Their Fingers in Math Class

Using Fingers to Count in M... www.theatlantic.com

Evidence from brain science suggests that far from being “babyish,” the technique is essential for mathematical achievement.

An update on our resources

We continue to update our resource pages to align with our message of high leverage practices to promote deep learning. Here is what we have accomplished so far:

- Hyperlinked each course title - This will take you to our digital resources such as lesson ideas and tasks. As we continue to add resources we are mindful of our message. Lessons and tasks added promote reasoning and problem solving as outlined above.

- Updated resource guides - The field has spoken and we have heard you! You want this information. We have added our first few DRAFT resource guides and are working feverishly to make more available to you. Check back often!

Feel free to provide feedback on the new resource documents. If you think we missed an "I can" statement, or maybe we missed an opportunity to vertically articulate, use this link (or the one on our standards page) to add your thoughts.

Teacher Spotlight - Dana Hartzell

My name is Dana Hartzell, and I am currently in my third year as the 5th/6th high ability teacher at Maple Ridge Elementary in Pendleton, Indiana. Prior to my three years in South Madison Community Schools, I spent 12 years teaching for Muncie Community Schools at Longfellow Elementary and East Washington Academy. I began my career as a math coach and taught general education 1st and 2nd grade. After obtaining my high ability licensure through Ball State, I moved on to teach 1st, 2nd, and 3rd-grade self-contained high ability classes. To say that it's been a busy 15 years is an understatement!

During my childhood education, I always proclaimed that I "hated" math. I didn't understand it and didn't take the time to sit down and truly work at it. I had a truly fixed mindset. In my journey as a teacher, I have come to discover that there are ways that we can change our students' fixed mindsets about math. Stepping away from the prescribed daily routines into exploration, in-depth questioning, and hands-on manipulation allow students to understand the deeper concepts behind the math. No longer can we just present the material and hope that students absorb it. In my classroom, we question, we analyze, we critique, and we argue about mathematics. We make the math personal so that the students own their learning. We celebrate effort, explore mistakes, and challenge our minds. It is my purposeful intent to break the "I hate math" cycle and help students see the joy in numbers. If you want the same things for your students, let's connect: Twitter @hartzell_dana .

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